

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

IN THE CLAIMS:

Claim 1 (Original) An integrated circuit, comprising:

a first function block having a plurality of inputs and a plurality of outputs;

a first channel coupled to a first portion of the plurality of inputs located on a first side of the first function block and coupled to a first portion of the plurality of outputs located on the first side of the first function block;

a second channel coupled to a second portion of the plurality of inputs located on a second side of the first function block, the second side opposite the first side, and coupled to a second portion of the plurality of outputs located on the second side of the first function block;

a third channel coupled to the first channel and the second channel and coupled to a third portion of the plurality of inputs located on a third side of the first function block and coupled to a third portion of the plurality of outputs located on the third side of the first function block; and

a fourth channel associated with a fourth side of the function block that is opposite the third side, the fourth channel coupled only to the first channel and the second channel,

wherein there is at least one of: (a) a difference between any two of a number of inputs of the first, second, or third portion of the plurality of inputs, (b) a difference between any two of a number of outputs of the first, second, or third portion of the plurality of outputs, and (c) a difference between any two of the number of inputs combined with the number of outputs of the first, second, or third portion of the plurality of inputs and outputs.

Claim 2 (Original) The integrated circuit of claim 1 wherein there is a difference between any two of: (a) a number of a first plurality of wires within the first channel, (b) a number of a second plurality of wires within the second channel, or (c) a number of a third plurality of wires within the third channel.

Claim 3 (Original) The integrated circuit of claim 1 further comprising

a wire driving device having a plurality of inputs and an output, a particular one of the plurality of inputs coupled to a particular one of the plurality of outputs on a particular function block side that is any one of the first side, the second side, or the third side of the first function block, the wire driving device driving a signal, output by the first function block, on a particular one of a first plurality of wires within the first channel, a second plurality of wires within the second channel, or a third plurality of wires within the third channel that is associated with the particular function block side; and

an input multiplexer having a plurality of inputs and an output, a particular one of the plurality of inputs coupled to the particular one of the first plurality of wires within the first channel, the second plurality of wires within the second channel, or the third plurality of wires within the third channel that is associated with the particular function block side,

wherein the wire driving device is upstream from the input multiplexer.

Claim 4 (Original) The integrated circuit of claim 3 wherein the wire driving device drives the signal to at least one of the particular one of the plurality of inputs of the input multiplexer, and up to a length of the particular one of the first plurality of wires, the second plurality of wires, or the third plurality of wires minus a length of the first function block away.

Claim 5 (Original) The integrated circuit of claim 1 further comprising

an input multiplexer having a plurality of inputs and an output, the output coupled to a particular one of the plurality of inputs on a particular function block side that is any one of the first side, the second side, or the third side of the first function block; and

a wire driving device having a plurality of inputs and an output, a particular one of the plurality of inputs coupled to a particular one of the plurality of outputs on the particular function block side, the output of the wire driving device driving a particular one of a first plurality of wires within the first channel, a second plurality of wires within the second channel, or a third plurality of wires within the third channel that is associated with the particular function block side,

wherein the input multiplexer is upstream from the wire driving device.

Claim 6 (Original) The integrated circuit of claim 5 wherein the wire driving device drives a signal up to the length of the particular one of the first plurality of wires, the second plurality of wires, or the third plurality of wires away.

Claim 7 (Original) The integrated circuit of claim 1 further comprising

a second function block having a plurality of inputs and a plurality of outputs;
an input multiplexer having a plurality of inputs and an output, the output coupled to a particular one of the plurality of inputs of the first function block; and
a wire driving device having a plurality of inputs and an output, a first one of the plurality of inputs of the wire driving device coupled to a particular one of the plurality of outputs of the first function block, and a second one of the plurality of inputs of the wire driving device coupled to a particular one of the plurality of outputs of the second function block, and the output of the wire driving device coupled to a particular one of the plurality of inputs of the input multiplexer,
wherein the wire driving device is downstream from the second function block and the wire driving device is upstream from the input multiplexer and the first function block.

Claim 8 (Original) The integrated circuit of claim 7 wherein the output of the wire driving device is coupled to a particular one of a first plurality of wires within the first channel, a second plurality of wires within the second channel, or a third plurality of wires within the third channel that is associated with the wire driving device.

Claim 9 (Original) The integrated circuit of claim 8 wherein the wire driving device drives a first signal from the second function block up to the length of the particular one of the first plurality of wires, the second plurality of wires, or the third plurality of wires away, or the wire driving device drives a second signal from the first function block to at least one of: (a) the particular one of the plurality of inputs of the input multiplexer, and (b) up to the length of the particular one of the first plurality of wires, the second plurality of wires, or the third plurality of wires minus the length of the first function block away.

Claim 10 (Original) The integrated circuit of claim 1 wherein a particular one of the plurality of inputs or a particular one of the plurality of outputs of the first function block is coupled to at least two of the first channel, the second channel, or the third channel.

Claim 11 (Original) The integrated circuit of claim 10 wherein the coupling to the third channel is coupling to a particular one of a third plurality of wires within the third channel, the coupling to the first channel is coupling to a particular one of a first plurality of wires within the first channel, and the coupling to the second channel is coupling to a particular one of a second plurality of wires within the second channel.

Claim 12 (Original) The integrated circuit of claim 1 wherein a particular one of the plurality of outputs of the first function block is directly coupled to a particular one of a plurality of inputs of a second function block.

Claim 13 (Original) The integrated circuit of claim 12 wherein an input multiplexer, coupled to the second function block and having a plurality of inputs and an output, a particular one of the plurality of inputs coupled to the particular one of the plurality of outputs of the first function block and the output of the input multiplexer coupled to the particular one of the plurality of inputs of the second function block.

Claim 14 (Original) The integrated circuit of claim 1 wherein the integrated circuit is a programmable logic device.

Claim 15 (Original) The integrated circuit of claim 1 wherein the first function blocks is a logic array block, a memory block, an input/output block, or a multiply-accumulate block.

Claim 16 (Original) A digital system including the integrated circuit of claim 1.

Claim 17 (Original) An integrated circuit, comprising:

a first function block having a plurality of inputs and a plurality of outputs;

a first channel coupled to a first portion of the plurality of inputs located on a first side of the first function block and coupled to a first portion of the plurality of outputs located on the first side of the first function block;

a second channel coupled to a second portion of the plurality of inputs located on a second side of the first function block, the second side opposite the first side, and coupled to a second portion of the plurality of outputs located on the second side of the first function block;

a third channel coupled to the first channel and the second channel and coupled to a third portion of the plurality of inputs located on a third side of the first function block and coupled to a third portion of the plurality of outputs located on the third side of the first function block;

a fourth channel associated with a fourth side of the function block that is opposite the third side, the fourth channel coupled only to the first channel and the second channel;

an input multiplexer having a plurality of inputs and an output, the output coupled to a particular one of the plurality of inputs on a particular function block side that is any one of the first side, the second side, or the third side of the first function block; and

a wire driving device having a plurality of inputs and an output, a particular one of the plurality of inputs coupled to a particular one of the plurality of outputs on the particular function block side, the output of the wire driving device driving a particular one of a first plurality of wires within the first channel, a second plurality of wires within the second channel, or a third plurality of wires within the third channel that is associated with the particular function block side,

wherein the input multiplexer is upstream from the wire driving device.

Claim 18 (Original) The integrated circuit of claim 17 wherein the wire driving device drives a signal up to the length of the particular one of the first plurality of wires, the second plurality of wires, or the third plurality of wires away.

Claim 19 (Original) The integrated circuit of claim 17 wherein there is at least one of: (a) a difference between any two of a number of inputs of the first, second, or third portion of the

plurality of inputs, (b) a difference between any two of a number of outputs of the first, second, or third portion of the plurality of outputs, and (c) a difference between any two of the number of inputs combined with the number of outputs of the first, second, or third portion of the plurality of inputs and outputs.

Claim 20 (Original) The integrated circuit of claim 17 wherein there is a difference between any two of: (a) a number of a first plurality of wires within the first channel, (b) a number of a second plurality of wires within the second channel, or (c) a number of a third plurality of wires within the third channel.

Claims 21-75 (Canceled)